REMARKS

Claims 11-12 have been added. No new matter was added. Thus, claims 1 and 4-12 are pending in the present application. Applicant submits arguments for overcoming the rejections recited in the non-final Office Action dated July 22, 2010. For reasons stated herein, Applicant respectfully submits that the present application is in condition for allowance.

I. Claim Rejections - 35 USC §112, second paragraph

In the non-final Office Action dated July 22, 20109, claims 1 and 4-10 are rejected under 35 USC §112, second paragraph, as being indefinite.

According to the Examiner's suggestion, the limitation with respect to defining "Ra" in claim 1 has been amended to recite a Markush group. No new matter was added. Applicant respectfully requests reconsideration and removal of the rejection.

II. Claim Rejections - 35 USC §103(a)

A. *In the non-final Office Action dated July 22, 2010, claims 1, 5 and 8-10 are rejected under 35 USC §103(a) as being obvious over JP 09-260139 A of Takeda et al. in view of a 1992 publication of Bates et al. and in further view of JP 09-316630 A of Watanabe et al.*

The claims of the present application are directed to a sintered body sputtering target made of a specified perovskite oxide ceramic material having high density and low electrical resistance. More specifically, the sputtering target is required to have a relative density of 95% or more and a resistivity of 10Ωcm or less.

At the time the present invention was made, a sputtering target of the claimed perovskite oxide ceramic material and of a high density for depositing a thin film via a sputtering process did not exist and was not known by one of ordinary skill in the art. (See page 1, lines 26-28, of

the present application, as filed.) When a conventional perovskite oxide ceramic material of the claimed composition was used as a sputtering target, its density and strength were low and there were problems with fractures and cracks occurring during target manufacture, transfer of the target, and sputtering operations. (See page 2, lines 1-5, of the present application, as filed.) Further, such a low density sputtering target provides problems in that the unwanted generation of particles increase during the sputtering deposition process thereby deteriorating the quality of the thin films produced and increasing the amount of defective products. (See page 2, lines 1-5, of the present application, as filed.)

As best stated on page 2, lines 8-10, of the present application, as filed: "Therefore the improvement of density in this kind of ceramic material target existed as an extremely formidable challenge."

Based on the inventor's significant inventive contribution, the present invention provides a sputtering target that inhibits the occurrence of fractures and cracks and inhibits the generation of particles during sputtering. Thus, the present invention greatly improves yield with respect to manufacture and use of the sputtering target and greatly improves the quality of the film deposited via sputtering and reduces the generation of defective products.

With respect to the cited references, only Bates et al. and JP '630 disclose anything relative to density. However, the discussion of relative density in Bates et al. is limited to the following compositions: La-Sr-Cr-O and Y-Ca-Cr-O; and the discussion of relative density in JP '630 is limited to a composition of Ba-Sr-Ti-O. Accordingly, none of these compositions reads on or overlaps with that required by the claims of the present application. Thus, it is respectfully submitted that one of ordinary skill in the art at the time the present invention was made is provided with no common sense teaching from the cited prior art with respect to a sintered body

sputtering target of the claimed perovskite oxide ceramic material of a high density (95% or greater) for depositing a thin film via a sputtering process. Such a target did not exist and was not known to one of ordinary skill in the art including one of ordinary skill in the art having knowledge of JP '139 (which fails to address density), Bates et al. (which addresses a different composition) and JP '630 (which addresses a different composition). Accordingly, Applicant respectfully submits that the claims of the present application are patentable over JP '139 in view of Bates et al. and further in view of JP '630 for at least this reason.

Applicant also submits additional reasons for the patentability of the claims of the present application.

The objective of JP '139 is to provide a "magneto-resistance effect type device" for use as a highly sensitive magnetic sensor. See Paragraph Nos. 0001-0002 of JP '139. JP '139 provides a teaching to one of ordinary skill in the art that if the composition ratio of Mn/(La+A) of its disclosed composition (La-A-Mn-O or Y-A-Mn-O) is 1.0 or more, magnetic resistance will undesirably deteriorate. See Paragraph No. 0010 of JP '139. Thus, JP '139 requires the use of "y" in Mn_y of its composition being less than 1.0 because otherwise magnetic resistance will be too small for the intended purpose and use of the device of JP '139. Thus, one of ordinary skill in the art learns from this that the composition ratio of Mn/(La+A) must be less than 1.0 if the desired magnetic resistance is to be obtained.

When a §103 rejection is based upon a modification of a reference that destroys the intent, purpose or function of the invention disclosed in the reference, such a proposed modification is not proper and a *prima facie* case of obviousness cannot be properly made. In re Gordon, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

Here, a reduction of magnetic resistance is not desired for a magnetic sensor and using "y" in Mn_y in the composition of JP '139 of 1.0 or more will clearly destroy the intent, purpose and function of the invention disclosed in JP '139. Thus, one of ordinary skill in the art would not find it obvious to make a modification to JP '139 that would destroy the purpose of the invention disclosed by JP '139.

Also, teaching away is the antithesis of the art suggesting that the person of ordinary skill in the art go in the claimed direction. Essentially, teaching away is a per se demonstration of lack of obviousness. In re Fine, 873 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

Here JP '139 clearly teaches away from the compositional ratio required by the claims of the present application and it would not be obvious for one of ordinary skill in the art to modify the compositional ratio required by JP '139 in a manner requiring "y" in Mn_y of JP '319 to be 1.0. This would be the opposite of that taught by JP '139.

Accordingly, for these reasons, Applicant respectfully submits that the composition of JP '139 does not read on or overlap with that required by the claims of the present application. Thus, Applicant respectfully submits that a case of *prima facie* obviousness cannot be fairly established with JP '139 and its teachings which are contrary and opposite to that required by the claims of the present application (even if the specification of JP '139 or its machine translation contains a typographical error).

Turning to the Bates et al. reference, Applicant respectfully submits that this reference has been misinterpreted in the Office Action. First, Bates et al. only disclose a relative density for compositions of La-Sr-Cr-O and Y-Ca-Cr-O (see Section 3 "Air-Sintering of Chromites" on pages 237-240). Only chromites are discussed in this section. Absolutely no information is disclosed with respect to the relative density of manganites.

The only discussion of manganites by Bates et al. is in Section 4, "Electrical Transport and Thermal Properties", pages 240-241. Also, in the Abstract of Bates et al., the only reference to manganites is as follows:

> "The electrical conductivity and thermal expansion also increase with increasing alkaline-earth substitution for the lanthanum or yttrium chromites and manganites. In addition, the electrical, thermal and structural properties of these perovskite materials are also influenced by the synthesis and processing conditions as well as by thermal cycling and heat treatment in air."

Thus, one of ordinary skill in the art learns nothing concerning the relative density of manganite sputtering targets from Bates.

Further, in the claims of the present application, the upper limit for the average crystal grain size of the claimed sintered body sputtering target is stated as 100μm. In addition, the claims of the present application require a sintered body sputtering target having a resistivity of 10Ωcm or less. However, if the average grain size is less than 1μm, the volume of the grain boundary with high resistance will increase and the resistivity will necessarily become greater than 10Ωcm. Accordingly, assuming the Examiner reads Bates et al. as disclosing an average grain size of 1 to 100nm as stated in the Office Action, this range will take the sputtering target outside the required average grain size and resistivity parameters. For example, a sputtering target of the composition required by the claims of the present application having an average crystal grain size of 1 to 100nm will not have resistivity of 10Ωcm or less.

Thus, Bates et al. clearly fail to disclose the combination of limitations required by the present application including the composition, the relative density, the average crystal grain size, and resistivity and it would not be obvious for one of ordinary skill in the art to achieve the present invention at the time the present invention was made when the teachings of Bates et al. is combined with any of the other cited references.

Turning to JP '630, it discloses a BaSrTi oxide based sputtering target for forming a dielectric thin film. This is entirely different in nature, property, function and purpose relative to the composition required by the claims of the present application and those of ordinary skill in the art would understand that the attributes of these materials would be considerably different. Moreover, since the sinter-ability of materials differs depending upon their compositional components, different materials would not be manufactured under the same conditions.

One of ordinary skill in the art learns nothing relevant to the present invention because JP '630 provides absolutely no teachings with respect to a sputtering target made of a composition having extremely inferior sinter-ability as with the composition required by the present application. Thus, JP '630 neither addresses the problem addressed by the present invention nor offers any assistance in overcoming such a problem.

Accordingly, for all of the above stated reasons, Applicant respectfully submits that it would not have been obvious to one of ordinary skill in the art at the time the present invention was made to produce a sintered body sputtering target having the properties as claimed in the present application. Thus, Applicant respectfully requests reconsideration and removal of the rejection based on JP '139 in view of Bates et al. and further in view of JP '630.

B. *In the non-final Office Action dated July 22, 2010, claims 4, 6 and 7 are rejected under 35 USC §103(a) as being obvious over JP 09-260139 A of Takeda et al. in view of a 1992 publication of Bates et al. and in further view of JP 09-316630 A of Watanabe et al. and still further in view of the 2002 publication of Fiebig (Dortmund University).*

JP '319, Bates et al. and JP '330 and the deficiencies thereof relative to the claims of the present application are discussed above in detail.

The Fiebig (Dortmund) publication fails to provide any disclosure relative to a sintered compact sputtering target and the relative density thereof. Thus, Fiebig fails to disclose any claimed feature of the present invention and certainly fails to disclose a sputtering target of the claimed composition meeting the relative density requirement of the claims.

Still further, on page 5 of the Office Action dated July 22, 2010 under the above referenced rejection, it is concluded that "Bates already teaches substitution of A site element of rare earth elements such as La and Y by alkaline earth element such as Sr and Ca." Applicant respectfully disagrees that Bates et al. make such a disclosure.

Accordingly, Applicant respectfully submits that claims 4, 6, 7 and new claims 11 and 12 are patentable and non-obvious over JP '139 in view of Bates et al. and further in view of JP '630 and still further in view of Fiebig for the same reasons stated above with respect to the rejection based on JP '139 in view of Bates et al. and further in view of JP '630.

Accordingly, Applicant respectfully requests reconsideration and removal of the above stated rejection.

III. Conclusion

In view of the above amendments and arguments, Applicant respectfully submits that the rejections cited in the Office Action have been overcome and that the present application is in condition for allowance. Thus, a favorable action on the merits is therefore requested.

Please charge any deficiency or credit any overpayment for entering this Amendment to our deposit account no. 08-3040.

Respectfully submitted,
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